

What is claimed is:

1. An optical device comprising:

an optical fiber having a given length of diffraction grating formed in the direction of the optical axis thereof;

5 a rod-shaped piezoelectric element;

a means for applying a voltage to said piezoelectric element; and

a U-shaped member having a pair of arm portions,

said optical fiber being fixed to a pair of ends of said arm portions such that the diffraction grating of said optical fiber is positioned between the pair of
10 ends of said arm portions as if the ends of said arm portions stride the diffraction grating portion,

said piezoelectric element being fixed to said U-shaped member such that said piezoelectric element is connected to the pair of said arm portions at their intermediate points, and

15 said U-shaped member being made of a material having a larger thermal expansion coefficient than that of said piezoelectric element.

2. An optical device according to Claim 1, wherein said U-shaped member is made of stainless steel.

3. An optical device according to Claim 1, wherein said U-shaped member
20 is made of aluminum alloy.

4. An optical device comprising:

an optical fiber having a given length of diffraction grating formed in the direction of the optical axis thereof,

a rod-shaped piezoelectric element,
a means for applying a voltage to said piezoelectric element,
a rod-shaped member,
first members constituting a pair of arm parts, and

5 second members adhered to said first members;

said optical fiber being fixed to the ends of said pair of arm parts of said first members such that the diffraction grating of said optical fiber is positioned between the ends of said pair of arm parts of said first members, said rod-shaped member being fixed to the other ends (i.e., opposite the ends to which
10 said optical fiber is fixed) of said first members, said rod-shaped member and said pair of arm parts of said first members constituting a U-shaped member, said piezoelectric element being fixed to said first members so as to be connected to said pair of arm parts at their intermediate points, said second members being adhered to the first members longitudinally on the side
15 opposite to the side to which both said piezoelectric element and said rod-shaped member are fixed;

wherein said rod-shaped member and said piezoelectric element have a substantially equal thermal expansion coefficient, and said second members are made of a material having a thermal expansion coefficient that is larger
20 than that of said first members.

5. An optical device according to Claim 4, wherein said first members are made of Invar alloy.

6. An optical device according to Claim 4, wherein said first members are

ceramic.

7. An optical device according to Claim 4, wherein said second members are made of aluminum alloy.

8. An optical device according to Claim 4, wherein said rod-shaped
5 member is a piezoelectric element.

9. An optical device comprising:

an optical fiber having a given length of diffraction grating formed in the direction of the optical axis,

a rod-shaped piezoelectric element,

10 a means for applying a voltage to said piezoelectric element,

a rod-shaped member,

first members constituting a pair of arm parts, and

second members adhered to the first members;

said optical fiber being fixed to the ends of said pair of arm parts of said
15 first members such that the diffraction grating of said optical fiber is positioned between the ends of said pair of arm parts of said first members, said rod-shaped member being fixed to the other ends (i.e., opposite the ends to which said optical fiber is fixed) of said first members, said rod-shaped member and said pair of arm parts of said first members constituting a U-shaped member,
20 said piezoelectric element being fixed to said first members so as to be connected to said pair of arm parts at their intermediate points, said second members being adhered to the first members longitudinally on the side to which both said piezoelectric element and said rod-shaped member are fixed;

wherein said rod-shaped member and said piezoelectric element have a substantially equal thermal expansion coefficient, and said second members are made of a material having a thermal expansion coefficient that is lower than that of said first members.